

**REMARKS**

Reconsideration of this application is respectfully requested.

Claims 1-16 and 32 were rejected under 35 U.S.C. § 103 as being unpatentable over Matthews, (U.S. 6,148,867) in view of Beer et al. (U.S. 5,910,458). The rejection is respectfully traversed, for at least the following reasons:

an exterior facing adhered to the exterior surface; and  
a bonded, non-woven glass mat facing adhered to the interior surface, the mat having a plurality of parallel or substantially parallel fibers oriented in a machine longitudinal direction of the duct board material.

Claims 1 and 11 are amended to refer to the machine longitudinal direction of the duct board material. One of ordinary skill understands that the machine direction is the longitudinal direction of an axis of the product as it is formed by the machine, which may differ from the direction in which an individual cut sheet of duct board has its longer dimension. The machine longitudinal direction of the insulation does not change, regardless of the shape (i.e., length and width) into which the insulation is cut.

Matthews is directed to a duct board or duct liner having a plurality of kerfs formed therein to control flexibility in the direction perpendicular to the kerfs. As best seen in the enlarged detailed FIGS. 6 to 9A of Matthews, the fibers in Matthews duct liner generally run perpendicular to the kerfs. These figures show the fibers generally extending from left to right (the machine direction), with the kerfs extending into the page. In other words, Matthews kerfs are formed in the cross direction, not the machine direction. Matthews adds the kerfs to the duct liner to control the flexibility in the direction normal to the kerfs. This makes it easier for the duct liner to conform to the metal duct, as shown in FIGS. 3 and 5 of Matthews.

An example of the product described by Matthews is the Spracoustic Plus<sup>TM</sup> system, sold by Johns Manville. A copy of an information sheet on this product is enclosed, showing sheets of the product with the kerfs running in the cross direction. Matthews' product is intended to be cut along (or parallel to) the kerfs, to a desired size that fits the duct into which the liner is installed. For example, if the duct has a diameter of 32", then a section that is  $32 * \pi$  inches long is cut. By aligning his kerfs in the cross direction, Matthews allows one sheet size of his product

(e.g., 10 feet long x 4 feet wide) be used to fit any duct diameter, with the length of a duct section lined thereby equal to the width of a sheet (e.g., four feet).

One of ordinary skill in the art would not modify Matthews' product to include a plurality of parallel or substantially parallel fibers oriented in a machine longitudinal direction of the duct board material (as claimed by Applicant) or combine Matthews with a mat having longitudinal fibers as described by Beer et al. Because Matthews kerfs are oriented in the cross direction, the result would be that the kerfs would be formed perpendicular to the parallel or substantially parallel fibers, and would sever the fibers into short lengths of as little as 1.57 inches in length. The cutting disclosed by Matthews would destroy the reinforcing and stiffening provided by parallel (or substantially parallel) fibers. It would make the surface more flexible rather than more stiff.

Further, the Beer mat is designed to be used as composite reinforcement, wherein the mat would be saturated with a resin. A mat that is adhered (as claimed in claim 1) can provide improved thermal and acoustical insulating properties compared to a resin saturated mat as described by Beer et al.

Thus, the rejection of claim 1 over Matthews in view of Beer et al. should be withdrawn.

Claims 2-10, 11 and 32 should be patentable for at least the same reasons set forth above with respect to claim 1.

Claim 12 requires, "a plurality of parallel or substantially parallel fibers oriented in a longitudinal direction of the duct board material and adhered directly to the unfaced interior surface, so that a portion of the interior surface not covered by the parallel or substantially parallel fibers is exposed." [emphasis added]. The Action alleges that Beer discloses this feature.

Beer discloses a two-layer reinforcing material having a mat and fiber strands adapted to reinforce a thermosetting matrix material to form a composite. Combining Beer's material with the duct liner of Matthews et al. would result in a faced product. Further, combining Beer's material with the duct liner of Matthews et al. would either result in (1) a product with Beer's

fiber strands adhered to Matthews insulation layer, and Beer's secondary layer (mat) facing outwards; or (2) a product with Beer's fiber strands facing outward, but none of the fiber strands adhered directly to the unfaced interior surface.

Thus, the combined teachings of Matthews et al. and Beer et al. do not render claim 12 obvious, and claim 12 should be allowed. Claims 13-16 are dependent on claim 12, and should be allowable for at least the same reasons.

New claims 33-35 are directed to distinguishing features of Applicant's claimed non-woven mat. Applicants' bonded non-woven mat is a wet-laid mat. As understood by one of ordinary skill, a wet laid mat is provided by a modified paper-making process. The resulting wet-laid non-woven structures have textile-fabric characteristics, primarily flexibility and strength. Applicants' bonded non-woven wet-laid mat is a surfacing mat, and whether reinforced or not, is a relatively thin and lightweight layer that reinforces, and provides stiffness to, a composite ductboard. As further detailed in respective claims 34 and 35, the mat has a weight per unit area of about 38.8 grams/meter<sup>2</sup> and a thickness of about 0.033 centimeters (0.013 inch), respectively.

The mat described by Beer et al. does not suggest the features of claims 33-35. Beer uses a needling process to entangle his fibers. The needle punched mat disclosed by Beer is for a much different use and of a much different construction than Applicant's claimed nonwoven wet-laid mat (claimed in claim 33). The Beer mat is much heavier and thicker. Beer's mat (secondary layer) is 715 to 1150 grams per square meter, which is 18 and 29 times heavier than Applicant's mat of claim 34. Beer's mat has a thickness of about 0.25 to 12 inches, which is 19 to 923 times thicker than Applicant's mat of claim 35.

Therefore, claims 33-35 should also be allowable.

Support for new claims 33-35 and the amendments to claims 1 and 11 is provided in paragraph [0060]. Support for the amendment to claim 12 is provided in paragraph [0078] and FIG. 7. No new matter is added

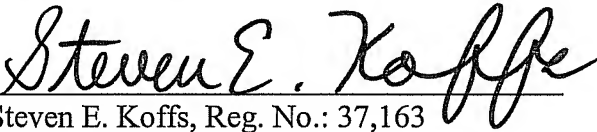
Appl. No. 10/757,893  
Amdt. dated August 15, 2006  
Reply to Office action of June 15, 2006

In view of the foregoing amendments and remarks, Applicant submits that this application is in condition for allowance. Early notification to that effect is respectfully requested.

The Assistant Commissioner for Patents is hereby authorized to charge any additional fees or credit any excess payment that may be associated with this communication to deposit account **04-1679**.

Respectfully submitted,

Dated: August 15, 2006

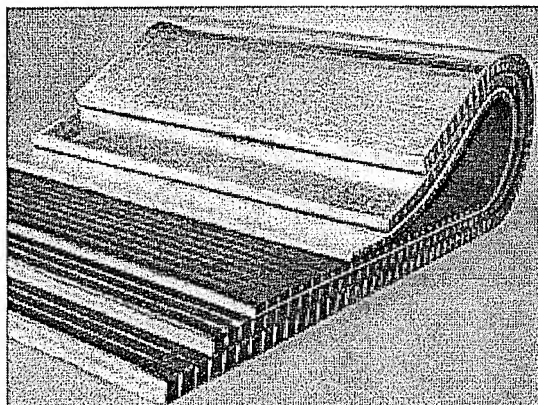
  
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Spiracoustic

## Spiracoustic Plus™



### PRODUCT OVERVIEW

#### LD Round Liner Board

This is the ideal "snap-in" liner for large ducts with diameters of 32" (813 mm) and higher. The natural tension of the rigid liner board holds it in place with minimal pinning or gluing. Spiracoustic Plus™ LD is widely used in such venues as sports arenas, entertainment facilities and convention centers.

#### SD Round Liner Board

Engineered for small diameter ducts, 18" to 58" (457 mm to 1473 mm), this insulation is also installed by forming it into a round configuration, taping the seam, collapsing the liner into a heart shape to insert it inside the duct and then snapping it back into place.

#### VSD Round Liner Board

For very small diameter ducts, 8" to 22" (203 mm to 559 mm), Spiracoustic Plus™ VSD is formed to the correct size and simply slipped into place inside the round duct.

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☐ Yes ☒ No

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